

CLIMATOLOGICAL DATA FOR OCTOBER, 1911.

DISTRICT No. 4, THE LAKE REGION.

Prof. HENRY J. COX, District Editor.

GENERAL SUMMARY.

The rapid movement of storm areas prominent in affecting the weather conditions in the district during the month of September, 1911, was not so marked in October, and, as a consequence, the changes in temperature were not so frequent; and, aside from the cold weather in the western Lake Superior region, the mean temperature for the month was not much below the normal.

Exceptionally heavy rains occurred over a considerable area, principally in the drainage basins of Lakes Michigan, Huron, and western Erie, and although in other sections the total rainfall was, as a rule, below the monthly normal, there was much cloudiness and a great deficiency in sunshine, except in the eastern and extreme northwestern portions—in strong contrast with the pleasant sunny October of 1910, when the so-called Indian summer was experienced at its best over the greater portion of the district.

A much larger number of thunderstorms than usual in October occurred, especially in the portion of the district reaching from Illinois eastward over Indiana to southern lower Michigan and northwestern Ohio. There were, however, only a few instances of destructive storms.

While killing frost had been noted in September in western upper Michigan and the Lake Champlain watershed, and was observed in a few interior counties of lower Michigan on October 8, it occurred in other sections from October 22 to 28, from two to three weeks later than usual, except that at a few points along the southeastern shore of Lake Michigan it had not occurred by the end of the month.

The following table summarizes the chief features of meteorological interest in the various portions of the district:

Portions of States lying within District No. 4.	Mean temperature.	Departure from normal.	Mean precipitation (inches).	Departure from normal.	Greatest precipitation in 24 hours (inches).	Number of days.				Prevailing direction.
							With 0.1 or more (Inch).	Clear.	Partly cloudy.	
Minnesota.....	41.4	-2.1	1.10	-1.84	0.54	T.	5	14	8	w.
Wisconsin.....	47.0	-1.3	4.67	+2.66	2.51	0.1	10	10	8	nw.
Illinois.....	53.3	+0.1	3.79	+1.24	1.25	T.	12	7	9	w.
Indiana.....	51.4	+0.2	3.98	+1.66	1.53	T.	13	10	7	ne.
Upper Michigan.....	44.1	-0.8	3.13	+0.43	2.62	0.4	10	9	8	w.
Lower Michigan.....	48.2	-1.3	4.98	+2.33	2.40	0.1	11	9	8	sw.
Ohio.....	51.6	-0.9	4.98	+2.60	2.70	T.	12	11	8	sw.
Pennsylvania.....	51.5	-1.6	3.47	-0.33	1.20	0	13	5	10	se.
New York.....	48.2	-0.5	2.98	-0.33	2.31	1.1	11	10	11	w.
Vermont.....	46.1	-1.0	3.75	+1.09	2.05	0.7	11	9	11	s.

TEMPERATURE.

In the Keweenaw Peninsula and the eastern portion of upper Michigan, the northern portion of lower Michigan, almost generally in the Lake Michigan Basin, at a few points along the northern frontier of New York and in the eastern portion of the Vermont section, the mean temperature of the month was a fraction of a degree above the seasonal normal, while in other portions of the district there was a deficiency, the departure being greatest in Minnesota and Indiana where it exceeded 2°. In fact, the mean in Minnesota was the lowest on record for October in the portion of the district in that State.

As a rule the temperature was below the normal during the most of the first and third decades and above during the second. The period of comparatively cool weather of the first decade began in the closing days of September. The greatest cold occurred during the last week of the month when minimum temperatures were either down to freezing and below or sufficiently low to cause killing frosts at nearly all stations.

At no time was the heat excessive for the season of the year, as shown by the departures from the daily mean temperatures, the excess in only two instances exceeding 15°. The dates of highest temperature differed considerably in the various portions of the district, but were confined to the period from the 3d to the 12th.

The absolute range in temperature was 76° from a maximum of 82° at Hammond, Ind., on the 3d, and at Berne, Ind., and several points in Ohio on the 6th to a minimum of 6° at Stephens Mine, Minn., on the 31st.

PRECIPITATION.

There was less than the usual amount of precipitation in the Lake Superior region, especially in the western and central portions, where the deficiency exceeded 1 inch. There was a deficiency also in the Pennsylvania section, the greater portion of the New York section, and in that portion of Vermont bordering on Lake Champlain. Elsewhere there was an excess in precipitation, the departures being considerable in the central and southwestern sections. The amounts equaled or exceeded in many instances twice the normal October rainfall in northern Ohio, southern and central lower Michigan, and in the Green Bay region and Fox River Valley of Wisconsin, several stations within this area reporting the heaviest October rainfall on record—more than 7 inches. The largest total reported was 7.42 inches at Waupaca, Wis., which is 5.13 inches above the normal.

The heaviest rains occurred mainly during the first week of the month, this rainy period really being continuous from the last week in September. This period and that of temperature below the normal referred to above rather closely coincide. Rain did not fall as frequently during the balance of the month, but it was nevertheless well distributed, the number of rainy days being far above the normal for October within the area of excessive precipitation. There was a rainfall of 2.27 inches at Milwaukee, Wis., on the 3d, and the following heavy rainfalls were noted in Ohio: Akron, 2.70 inches on the 1st; Bucyrus, 2 inches on the 17th; Hiram, 2 inches on the 1st, in 6 hours; Hudson, 2.55 inches on the 1st, in 10 hours; Medina, 2.23 inches on the 1st, in 6 hours; Tiffin, 2.10 inches on the 1st. Concerning the heavy October rainfall in the Lower Michigan Peninsula, Mr. C. F. Schneider, section director, reports as follows:

The period of heaviest rainfall was from the 1st to 6th, inclusive, and 3 to 5 inches fell during this time at many stations in the lower peninsula. This was a continuation of a rainy period beginning September 24. From September 24 to October 6, inclusive, the total rainfall at Grand Rapids was 9.25 inches, Grand Haven 7.80, Big Rapids 6.11, Saranac 8.22, Owosso 5.55, and Saginaw 6.02. While the heavy rainfall in some localities caused all streams in the affected districts to rise somewhat, there was nothing approaching flood conditions. At Grand Rapids the maximum river stage was only 3.4 feet above the stage previous to the beginning of the rainy period.

Snow fell in nearly all portions of the district, although it was very light except in the Adirondack region on the 6th and 7th, when a heavy fall occurred.

SEVERE STORMS.

There was less wind movement than usual for October and but few severe windstorms, the stormiest period being generally from the 1st to the 4th. The highest velocity reported at any station was 64 miles from the southwest at Buffalo. Some little damage was done in Ohio by the combined wind and rain storms, as shown by the statement of Prof. J. Warren Smith, section director, Columbus, Ohio:

A large amount of damage was done along the southern border of the district by the heavy rain and wind storm that occurred on the 1st. In Allen, Hardin, and Wyandot Counties the high wind demolished a number of barns, unroofed several houses, destroyed orchards, and damaged a large amount of corn. In Summit County the rainfall was especially heavy and considerable damage was done by flooding. Washouts were reported on several railroads and the plant of the Akron

Selle Co. was flooded, throwing more than 200 men out of work for a short time. A gale passed over Lake Erie on the 4th, doing minor damage in Cleveland and other places along the lake shore. Many apples were blown from the trees in Ottawa County. At Cleveland a large Government dredge was blown upon the breakwater and badly damaged.

MISCELLANEOUS.

Fog.—Fog was observed on a couple of days during the first decade in the Lake Superior region, but it occurred mainly during the second decade in other portions of the district. Transportation interests, as far as known, were not affected, except in the Detroit River in the early morning of the 18th, when the fog became so dense as to require the suspension of navigation for two and a half hours.

Auroras.—Auroras were observed in Vermont and New York State on the 10th and 24th and in Michigan on the 18th.

OCTOBER, 1911, LAKE LEVELS.

The following data, from the report of the United States Lake Survey Office, relative to water levels of the Great Lakes during the month, are reproduced here because of their value to various interests in this district:

Mean October level above tidewater at New York.

	Feet.
Superior.....	602.23
Michigan-Huron.....	579.60
Erie.....	571.53
Ontario.....	244.62

Lake Superior is 0.03 foot higher than last month, 0.31 foot higher than a year ago, 0.64 foot below the average stage of October of the last 10 years, 1.33 feet below the high stage of October, 1869, and 0.65 foot above the low stage of October, 1879. It will probably fall 0.2 foot during November.

Lakes Michigan-Huron are 0.03 foot lower than last month, 0.49 foot lower than a year ago, 1.14 feet below the average stage of October of the last 10 years, 3.44 feet below the high stage of October, 1885, and 0.13 foot above the low stage of October, 1896. They will probably fall 0.3 foot during November.

Lake Erie is at the same level as last month, 0.35 foot lower than a year ago, 0.62 foot lower than the average stage of October of the last 10 years, 2.17 feet below the high stage of October, 1885, and 0.73 foot above the low stage of October, 1895. It will probably fall 0.3 foot during November.

Lake Ontario is 0.29 foot lower than last month, 0.76 foot lower than a year ago, 1.25 feet lower than the average stage of October of the last 10 years, 3.19 feet below the high stage of October, 1861, and 0.95 foot above the low stage of October, 1895. It will probably fall 0.3 foot during November.

TABLE 1.—Climatological data for October, 1911. District No. 4, Lake Region.

Stations.	Counties.	Elevation, feet.	Length of record, years.	Temperature, in degrees Fahrenheit.						Precipitation, in inches.						Number of rainy days, 0.01 inch or more.	Number of clear days.	Number of partly cloudy days.	Number of cloudy days.	Prevailing wind direction.	Observers.	
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall, unmeasured.								
<i>Minnesota.</i>																						
Cloquet.	Carlton.	800	40	40.4	- 3.3	69	11	9	31	38	1.54	- 1.37	0.50	T.	6	11	7	13	n.w.	S. B. Detwiler.		
Duluth.	St. Louis.	1,133	40	41.9	- 3.3	66	8	16	31	26	1.37	- 1.37	0.50	T.	9	9	9	13	w.	U. S. Weather Bureau.		
Floodwood.	do.	1,257	6	41.2	- 3.3	71	12	6	31	39	0.80	- 1.12	0.50	0	3	18	3	10	n.	M. H. Schussler.		
Stephens Mine.	do.	1,500	4	39.9	- 1.2	67	9	15	31	30	1.00	- 2.09	0.54	0	4	13	8	6	w.	Oliver Iron Mining Co.		
Two Harbors.	Lake.	614	17	44.0	- 1.8	71	12	10	31	37	0.74	- 2.07	0.50	0	4	16	2	2	ne.	G. W. Watts.		
Virginia.	St. Louis.	1,434	17	40.6	- 1.8	71	12	10	31	37	0.38	- 2.07	T.	5	13	7	11	w.	Oliver Iron Mining Co.			
<i>Wisconsin.</i>																						
Appleton.	Outagamie.	795	10	47.8	- 1.1	70	12	24	27	26	6.34	+ 4.59	1.99	0.2	15	13	4	14	w.	Wm. O. Thiede.		
Ashland.	Ashland.	647	20	44.6	- 3.2	70	9	21	31	32	2.34	- 0.50	1.02	0	6	15	11	5	ne.	Sam Wheeler.		
Bayfield.	Bayfield.	635	2	45.2	- 3.2	69	8	21	31	24	1.79	- 1.12	0.80	0	6	11	16	4	sw.	John P. Kiel.		
Cecil.	Shawano.	804	13	46.4	- 1.2	72	12†	26	27	34	5.87	+ 3.46	2.31	T.	10	8	16	7	sw.	Louis W. Schmidt.		
Crandon.	Forest.	1,060	16	43.2	- 1.0	66	9	19	30	30	4.68	+ 2.08	2.31	T.	7	13	4	14	e.	Fred S. Evans.		
Fond du Lac.	Fond du Lac.	800	25	46.8	- 1.7	69	12	22	27†	33	4.17	+ 2.12	1.70	T.	6	8	6	17	ne.	Geo. W. Marshall.		
Grand River Locks.	Marquette.	770	15	47.6	- 0.1	68	18†	21	27	32	5.63	+ 2.65	1.46	0	13	11	5	15	sw.	Jerry Parkinson.		
Green Bay.	Brown.	617	25	47.2	+ 0.1	67	16	24	27	22	4.68	+ 2.31	2.08	T.	10	5	8	14	sw.	U. S. Weather Bureau.		
High Falls.	Marinette.	810	0	45.2	- 2.4	72	12	16	27	38	5.94	- 1.12	2.51	T.	8	2	20	9	nw.	No. Hydro-Elec. Pow. Co.		
Iron River.	Bayfield.	1,096	2	42.6	- 2.4	71	12	10	31	36	2.30	- 1.12	0.75	0	10	13	9	9	w.	Winfield E. Tripp.		
Kewaunee.	Kewaunee.	590	2	48.0	- 0.6	66	8	26	27†	27	4.80	- 1.38	0.1	8	10	7	14	w.	Eugene V. Kimball.			
Manitowoc.	Manitowoc.	616	60	48.9	+ 0.6	68	11	25	27	22	6.00	+ 3.46	2.05	0	10	7	17	nw.	Johanna Lüps.			
Menasha.	Winnebago.	764	14	42.8	- 2.4	68	4†	22	24	3.55	4.15	+ 1.60	2.12	T.	8	13	3	15	sw.	Geo. T. Allanson.		
Menomonee Falls.	Waupkesha.	842	2	48.8	- 2.4	68	27	24	27	24	3.59	+ 1.41	0.5	10	10	6	15	nw.	Arthur H. Christman.			
Milwaukee.	Milwaukee.	681	40	50.3	+ 0.1	70	13	28	27	39	8.89	+ 1.50	2.27	0	12	7	5	19	ne.	U. S. Weather Bureau.		
New London.	Outagamie.	762	15	46.4	- 2.3	69	12	21	27	30	6.22	+ 3.77	2.50	T.	9	6	7	18	ne.	August H. Pape.		
Oconto.	Oconto.	590	20	46.8	- 1.7	68	12†	23	27	31	4.55	+ 2.31	1.74	0	9	11	10	10	w.	Wm. K. Smith.		
Oshkosh.	Winnebago.	744	22	47.0	- 2.4	68	18	20	27	29	4.91	+ 2.78	1.64	0	9	11	10	12	nw.	Evan Vincent.		
Pine River.	Waushara.	900	16	48.8	- 2.0	72	12	18	27	31	7.11	+ 4.76	1.89	0	13	6	13	11	sw.	Geo. H. Carpenter.		
Plum Island.	Door.	588	3	48.6	- 2.4	64	8	32	26†	23	4.66	- 1.90	T.	11	9	5	17	se.	Geo. C. Robinson.			
Plymouth.	Sheboygan.	843	1	47.8	- 2.4	69	12	23	27	26	4.72	- 1.75	T.	13	7	10	14	nw.	Paul O. Feldrappe.			
Port Washington.	Ozaukee.	713	18	49.4	0.0	70	18	26	27	24	2.63	+ 0.68	0.96	0.5	7	9	3	19	sw.	Richard C. Kann.		
Racine.	Racine.	633	14	50.2	- 2.3	71	4	25	28	28	4.11	+ 2.52	2.20	T.	9	15	3	13	nw.	Daniel Davis.		
Ripon.	Fond du Lac.	935	1	49.4	- 2.4	71	12	21	27	27	5.49	- 1.44	0	12	9	5	17	w.	Ripon College.			
Sheboygan.	Sheboygan.	831	12	49.5	- 1.0	66	18	25	27	20	5.12	+ 2.73	1.82	T.	8	7	10	14	se.	Louis C. Meyer.		
Sturgeon Bay.	Door.	600	12	46.4	- 0.9	63	12†	26	26	32	6.09	- 1.27	2.17	T.	11	9	13	9	nw.	Adam N. Dier.		
Superior.	Douglas.	671	2	42.6	- 2.4	66	8	18	31	28	1.73	- 0.55	0	7	8	14	9	sw.	Edward B. Banks.			
Waupaca.	Waupaca.	857	16	45.8	- 2.4	72	12	16	27	35	7.42	+ 5.13	2.39	0	11	10	5	16	w.	James H. Flagg.		
<i>Illinois.</i>																						
Chicago.	Cook.	824	41	53.3	+ 0.1	79	3	32	27	25	3.79	+ 1.24	1.25	T.	12	7	9	15	w.	U. S. Weather Bureau.		
<i>Indiana.</i>																						
Auburn.	Dekalb.	874	15	49.0 ^a	- 2.0	80 ^a	6	23	28	43*	2.92	+ 0.62	0.61	0	11	11	2*	17*	se.	Mrs. Josie B. Kuhiman.		
Berne.	Adams.	849	2	51.6	- 2.4	82	6	26	29†	32	3.25	- 0.30	0.90	0	14	10	14	7	ne.	Henry M. Reusser.		
Elkhart.	Elkhart.	801	9	53.8	- 2.4	76	16†	30	28	35	3.90	- 1.09	0.87	0	14	10	13	8	nw.	Dr. Miles Medical Co.		
Fort Wayne.	Allen.	856	15	51.2	- 2.5	80	6	29	29	32	3.51	- 1.09	1.53	0	18	5	9	17	ne.	U. S. Weather Bureau.		
Hammond.	Lake.	598	20	51.8	- 2.0	82	3	28	29	36	4.44	+ 2.63	1.20	0	8	7	6	18	nw.	Carson W. Whitney.		
Howe.	Lagrange.	886	6	51.4	- 2.4	80	16	26	28	34	3.72	- 1.05	0	0	7	14	0	17	se.	James E. Zook.		
South Bend.	St. Joseph.	728	18	50.6	- 2.5	77	6†	28	28	30	4.74	+ 2.32	1.47	T.	18	12	4	15	s.	Henry H. Swaim.		
Whiting.	Lake.	606	2	52.2	- 2.4	80	3	29	24	29	5.36	- 1.05	1.05	T.	15	12	6	13	sw.	D. H. Boyd.		
<i>Michigan—Upper Peninsula.</i>																						
Baraga.	Baraga.	623	9	42.8	- 2.4	71	9	13	31	37	2.40	- 0.91	T.	5	13	13	5	16	w.	D. S. S. & A. Ry.		
Bergland.	Ontonagon.	1,300	1	41.9	- 2.4	71	9	13	31	37	2.40	- 0.91	T.	5	13	13	5	16	s.	Frank McMonigal.		
Blaney.	Schoolcraft.																					
Calumet.	Houghton.	1,246	23	43.2	- 0.7	60	9†	20	30	17	2.17	- 1.02	0.84	1.0	10	9	9	13	w.	E. S. Grierson.		
Chatham.	Alger.	875	10	41.5	- 3.3	72	9	18	26	40	3.25	+ 0.43	1.22	2.0	13	12	6	13	n.	U. P. Experiment Sta.		
Deer Park.	Luce.	610	16	46.7	+ 0.5	63	16	24	26†	25	1.73	- 0.53	0.40	3.0	8	12	3	16	sw.	Mrs. Sarah E. McGaw.		
Detour.	Chippewa.	585	10	45.9 ^a	- 0.7	70 ^a	9	22	30	35*	4.93	+ 1.63	2.00*	T.	6*	6*	7*	10*	sw.	Linton Melvin.		
Eagle Harbor.	Keweenaw.	622	12	44.8	+ 2.4	62	10	21	31	26	1.66	- 0.71	1.41	T.	4	5	20	6	w.	John Nolen.		
Escanaba.	Delta.	612	38	45.6	+ 0.5	62	8	24	28	24	4.63	+ 1.54	1.98	T.	12	6	7	18	sw.	U. S. Weather Bureau.		
Ewen.	Ontonagon.	1,147	10	41.2	- 3.8	71	9	14	31	37	1.88	+ 0.09	0.83	0.5	10	9	1	21	nw.	W. B. Hatfield.		
Grand Marais.	Alger.	610	10	48.9	- 2.4	64	9	33	26†	15	1.42	- 1.24	0.86	0	2	13	16	2	nw.	Mrs. Lena Truedell.		
Green.	Ontonagon.	622	0	48.9	- 2.4	64	9	33	26†	15	1.42	- 1.24	0.86	0	1	11	6	21	w.	T. A. Green.		
Houghton.	Houghton.	688	10	44.7	+ 0.7	62	9	23	31	28	3.97	- 1.19	1.16	0.1	11	6	21	20	w.	U. S. Weather Bureau.		
Humboldt.	Marquette.	1,536	14	42.0 ^a	+ 0.1	69 ^a	9	14*	30†	34*	1.38	- 1.01	0.38*	T.	6*	8*	2*	20*	w.</			

TABLE 1.—Climatological data for October, 1911. District No. 4—Continued.

Stations	Counties	Elevation, feet	Length of record, years	Temperature, in degrees Fahrenheit						Precipitation, in inches						Number of rainy days, 0.01 inch or more	Number of clear days	Number of partly cloudy days	Number of cloudy days	Prevailing wind direction	Observers
				Mean	Departure from the normal	Highest	Date	Lowest	Date	Greatest daily range	Total	Departure from the normal	Greatest in 24 hours	Total snowfall, unmeasured	Number of rainy days, 0.01 inch or more						
<i>Michigan—Lower Peninsula—Cont.</i>																					
Battle Creek	Calhoun	822	27	49.9	- 1.9	73	16	26	27	28	6.07	+ 3.42	1.80	T. 0	10	7	8	16	s. ne.	Elmer E. Sager.	
Bay City	Bay	593	15	48.2	- 1.9	70	16	29	28	34					13	4	14		Pere Marquette R. R.		
Benzonia	Benzie	832	15												16	8	10	13	n.w.	J. W. Saunders.	
Berlin	St. Clair	22	48.2	- 0.7	70	15	26	28	35	4.80	+ 1.97	1.21	0.4	12	8	10	13	n.w.	R. O. Gould.		
Big Rapids	Mecosta	906	15	45.6	- 2.5	70	16	29	28	30	4.98	+ 4.30	1.73	0	16	9	8	14	n.w.	Charlie Gay.	
Bloomingdale	Van Buren	7	50.2			74	16	29	28	30			1.22	0	9	13	6	12	n.w.	John M. Haven.	
Cadillac	Wexford	1,293	2	46.4		66	15†	28	30	26	3.74		1.80	0	9	8	0	23	n.w.	Cadillac W. & L. Co.	
Cassopolis	Cass	903	10												17	0	14		Michigan Central R. R.		
Charlevoix	Charlevoix	610	33	46.0	- 3.4	64	16	30	14†	30				0	6	11	14	n.w.	Pere Marquette R. R.		
Charlotte	Eaton	7	48.6			70	16	28	27	29	4.31		1.40	0	8	16	4	11	e.	City of Charlotte.	
Cheboygan	Cheboygan	611	21	45.0	- 2.9	71	20	24	26†	34	4.68	+ 2.07	1.20	T. 0	8	7	16	8	e.	E. A. Bouchard.	
Clinton	Lenawee	830	21	51.2	+ 0.3	73	16	23	28	36	4.50	+ 2.21	1.00	T. 0	10	14	5	12	n.w.	David Woodward.	
Coldwater	Branch	984	14	51.5	- 2.1	74	16	22	24	38	4.33	+ 1.57	1.09	T. 0	12	13	2	15	se.	L. S. & M. S. R. R.	
Concord	Jackson	6	49.6			74	16	25	28	37	3.83		1.10	T. 0	8	12	14	5	sw.	W. N. Armstrong.	
Croton	Newaygo	685	3	48.5		73	16	27	28	31	7.33		1.35	0	14	3	15	13	w.	G. R. M. P. Co.	
Detroit	Wayne	730	40	50.8	- 0.9	70	16	32	28	21	4.30	+ 1.92	0.90	0	12	9	9	13	e.	U. S. Weather Bureau.	
Durand	Shiawassee	799	4																	H. J. Tobin.	
East Tawas	Iosco	590	14	46.8	- 2.0	64	14	22	28†	29	4.33	+ 1.82	1.10	0	13	14	11	6	sw.	D. & M. Ry.	
Eloise	Elmwood	640	14	50.2	- 2.5	70	4†	28	30	4.24	+ 1.93	0.88	0.88	12	9	8	14		John Gilmore.		
Flint	Genesee	730	22	48.0	- 0.8	70	16	28	28	38	3.53	+ 1.48	1.55	0	12	9	10	12	se.	William Fisher.	
Frankfort	Benzie	589	8	48.8		69	17	30	30	23	6.22		1.70	0	9	6	0	25	e.	Geo. Morenec.	
Ganges	Allegan	665	2	50.2		75	16	32	27†	24	6.86		1.79	T. 0	13	7	8	16	sw.	H. H. Hutchins.	
Gaylord	Otsego	1,367	11	44.2	- 1.2	68	9	20	30	34	5.57	+ 2.51	1.62	T. 0	12	3	8	20	sw.	Michigan Central R. R.	
Gladwin	Gladwin	794	15	46.2	- 1.8	73	15	25	28	36†	5.05	+ 2.85	2.40	T. 0	5d	15d	3d	9d	se.	Geo. R. Smith.	
Grand Haven	Ottawa	628	30	49.4	- 0.8	76	16	22	26	26	6.74	+ 4.25	2.20	0.3	15	5	9	17	e.	U. S. Weather Bureau.	
Grand Rapids	Kent	707	22	49.6	- 0.5	74	16	32	28	26	6.71	+ 4.17	2.11	0	12	4	8	19	se.	Do.	
Grape	Monroe	625	21	50.2	- 1.5	71	4	26	28	31	3.90	+ 1.91	1.00	0	13	9	10	12	w.	Joseph W. Morris.	
Grass Lake	Jackson	989	5	48.6		69	16	26	28	30	5.25		1.05	T. 0	6	18	2	11	ne.	Menzo Conklin.	
Grayling	Crawford	1,147	21	44.8	- 1.5	68	12†	23	30	34	5.56	+ 3.36	1.69	T. 0	8	9	8	14	n.w.	S. N. Inley.	
Harbor Beach	Huron	635	23	49.3	0	70	19	27	28	30	4.73	+ 2.14	1.80	0	7	10	12	9	ne.	Pere Marquette R. R.	
Harrison	Clare	1,159	18																	Do.	
Harrisonville	Alcona	616	27	46.4	+ 1.6	67	18	26	28†	31	3.61	+ 0.89	0.70	T. 0	13	8	9	14	sw.	D. W. Mitchell.	
Hart	Oceana	698	19	49.0	- 0.6	72	1	32	21	29	3.83	+ 1.23	0.68	0	9	2	12	17	sw.	Pere Marquette R. R.	
Hayes	Huron	620	21	48.0	- 1.9	72	16	30	28	31	4.18	+ 1.51	1.50	0	9	9	6	16	ne.	C. F. Leipprandt.	
Highland	Oakland	830	19												10					A. D. De Garmo.	
Hillsdale	Hillsdale	1,150	14	49.0	- 2.5	73	16	24	28†	29	4.62	+ 1.90	1.05	0.5	16	12 ^a	5 ^a	13 ^a	sw.	C. L. Herron.	
Holland	Ottawa	610	5	49.0		70	4	30	8†	25	6.44		1.70	T. 0	15	3	19	9	e.	City of Holland.	
Howell	Livingston	924	19	48.5	- 1.0	69	4	25	27	28	5.21	+ 3.05	1.50	0.4	12	10	8	13	sw.	Frank Sharp.	
Ivan	Kalkaska	22	45.6	- 0.8	68	15	24	30	30	5.87	+ 3.07	2.05	0.2	10	6	15	10	se.	O. L. Giddings.		
Jackson	Jackson	927	14	50.0	- 2.6	72	16	24	28	34	5.59	+ 0.90	0.94	T. 0	11	6	11	14	ne.	City of Jackson.	
Judd	St. Clair	667	22	48.7	- 0.8	70	16	26	28	28	4.31	+ 1.77	1.09	0.2	10	13	6	12	sw.	William Bice.	
Kalamazoo	Kalamazoo	955	33	49.8	- 1.1	75	16	28	29	30	5.49	+ 2.90	1.33	0	10	9	13	9	sw.	Kalamazoo Asylum.	
Lansing (Agr. Col.)	Ingham	820	47	48.0	- 0.7	71	16	26	28	30	5.00	+ 2.77	1.91	0.3	14	6	9	16	e.	U. S. Weather Bureau.	
Lansing (Capitol)	do	881	24	48.8	- 0.7	72	16	28	28	28	4.89	+ 2.52	1.83	T. 0	14	6	9	16	se.	State board of health.	
Lapeer	Lapeer	827	12	48.5	- 2.5	70	4	26	28	29	4.53	+ 2.53	1.34	0	8	1	22	2	sw.	Michigan Home.	
Ludington	Mason	586	13	48.4	- 2.1	72	16	31	26†	26	5.07	+ 2.95	1.00	T. 0	8	7	14	10	sw.	Pere Marquette R. R.	
Luther	Lake	1,028	1	45.8		70	15	26	28	36	6.48		1.95	T. 0	15	8	5	18	se.	John W. Nicholson.	
Mackinaw	Cheboygan	592	20	46.5	- 1.3	64	19	26	27	24	3.60	+ 0.10	0.75	0	9	6	16	9	sw.	G. R. & I. R. R.	
Mancelona	Antrim	1,121	15	46.2	- 1.0	69	16	24	30	29	6.00	+ 3.07	1.60	T. 0	7	18	1	12	se.	G. R. & I. R. R.	
Manistee	Manistee	600	14	49.5	+ 0.9	73	17	29	29	30	7.15	+ 4.77	2.00	0	7	14	0	7	n.w.	Pere Marquette R. R.	
Marshall	Calhoun	896	0																	E. B. Stuart.	
Midland	Midland	604	12	46.5	- 3.6	71	16	24	14	46	3.82	+ 1.23	1.10	T. 0	7	6	9	16	sw.	Pere Marquette R. R.	
Morenci	Lenawee	811	4	51.0		78	6	25	33	4.48		1.07	T. 0	14	10	5	16		sw.	George J. Tripp.	
Mount Clemens	Macomb	615	11			70	4	30	5	30	3.94	+ 2.02	1.11	0	11	13	0	18	sw.	Pere Marquette R. R.	
Mount Pleasant	Isabella	826	12	45.2	- 3.5	62	4	30	5	30	3.94	+ 2.02	1.11	0	7	15	0	16	w.	Pere Marquette R. R.	
Muskegon	Muskegon	587	15	49.8	- 1.3	75	16	30	27	24	3.10	+ 0.68	1.25	T. 0	7	8	4	19	w.	G. R. & I. R. R.	
Old Mission	Grand Traverse	858	17	47.8	- 1.9	70	9	25	30	27	6.00	+ 3.18	1.65	T. 0	10	7	11	13	n.w.	E. O. Ladd.	
Olivet	Eaton	934	21	47.8	- 1.1	70	16	28	27†	24	5.42	+ 2.88	1.13	0.5	16	12	4	15	s.	G. A. Knapp.	
Omer	Arenac	616	12			70	23	26	20	23	6.00	+ 0.20	0.80	0	5	3	9	19	sw.	D. & M. Ry.	
Onaway	Presque Isle	826	8	43.6		65	18	17	27	38	6.75		2.30	0	9	9	5	17	n.	Do.	
Owosso	Shiawassee	731	14	49.2	- 2.6	74	4	26	28	30	5.91	+ 3.55	1.99	0	14	2	20	7	n.w.	Owosso Sugar Co.	
Petoskey	Emmet	660	21	46.8	- 1.2	70	17†	25	30	30	3.74	+ 1.10	0.52	0	12	7	7	17	w.	G. R. & I. R. R.	
Plymouth	Plymouth	725	14	50.0	- 1.3	74	26	28	29	4.91	+ 2.70	1.23	T. 0	12	15	2	14	sw.	Pere Marquette R. R.		
Pontiac	Oakland	935	11	49.6	+ 0.4	70	15†	25	28	49	4.91	+ 2.70	1.22	T. 0	12	15	2	14	sw.	Fred W. Shaw.	
Port Austin	Huron	618	14	48.2	- 2.5	70	4	30	8</												

TABLE 1.—*Climatological data for October, 1911. District No. 4—Continued.*

Stations.	Counties.	Elevation, feet.	Length of record, years.	Temperature, in degrees Fahrenheit.						Precipitation, in inches.						Sky.	Prevailing wind direction.		
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall, unmeasured.	Number of rainy days, 0.01 inch or more.	Number of clear days.	Number of partly cloudy days.	Number of cloudy days.	
Ohio—Continued.																			
Fremont.	Sandusky.	628	9	52.4	—	81	6	29	29	33	5.71	—	1.30	0	11	14	4	13	sw.
Hedges.	Paulding.	725	17	51.5	- 1.0	82	6	23	28	35	3.88	+ 1.89	1.90	0	9	10	12	9	sw.
Hillhouse.	Lake.	997	18	50.9	- 0.7	80	4	29	29	33	6.02	+ 1.96	1.26	0	13	12	9	10	w.
Hiram.	Portage.	1,260	31	50.8	+ 0.0	73	4†	29	28	30	5.93	+ 3.11	2.00	T.	11	11	8	12	nw.
Hudson.	Summit.	1,153	50	50.5	- 1.0	75	6	26	29	33	7.22	+ 4.53	2.55	0	17	14	c	11	sw.
Lima.	Allen.	875	12	50.4	- 2.4	80	5	27	29	32	5.26	+ 0.56	1.02	0	6	14	8	9	nw.
Medina.	Medina.	944	23	51.3	- 0.9	76	6	24	29	35	6.20	+ 3.80	2.23	0	10	13	3	15	se.
Montpelier.	Williams.	880	19	51.2	+ 0.1	79	6	25	28	34	3.46	+ 1.21	0.77	T.	11	11	7	14	w.
Napoleon.	Henry.	680	24	52.8	- 0.2	81	6	29	29	32	5.01	+ 3.05	1.53	0	13	14	3	14	sw.
New Bremen.	Auglaize.	1,038	18	52.8	- 1.0	81	6	28	28	30	3.07	+ 1.16	0.62	0	8	15	8	8	nw.
North Royalton.	Cuyahoga.	1,000	18	51.3	- 1.6	74	6	29	29	31	6.24	+ 3.79	1.93	0	11	12	11	7	e.
Norwalk.	Huron.	719	25	52.7	- 0.2	80	6	27	29	34	5.31	+ 3.05	1.60	0	11	6	12	13	sw.
Oberlin.	Lorain.	855	36	51.4	- 0.4	78	6	26	29	34	5.06	+ 3.40	1.30	0	14	10	3	18	se.
Ottawa.	Putnam.	720	16	51.8	- 1.3	82	6	27	28	34	4.35	+ 2.46	1.10	T.	14	5	10	16	w.
Sandusky.	Erie.	629	34	52.4	- 1.5	79	6	32	29	30	5.06	+ 2.63	1.41	0	15	10	6	15	sw.
Tiffin.	Seneca.	775	29	51.8	- 0.3	78	6	30	29	30	5.15	+ 2.90	2.10	0	15	11	9	11	w.
Toledo.	Lucas.	769	40	51.4	- 1.2	78	6	33	29	31	4.46	+ 2.20	1.15	0	17	13	3	15	sw.
Upper Sandusky.	Wyandot.	854	28	52.6	- 0.6	80	6	28	29	32	4.43	+ 2.18	1.08	0	11	10	14	7	s.
Vickery.	Sandusky.	588	18	51.8	- 1.0	81	6	27	29	34	5.58	+ 3.21	1.52	0	15	10	7	14	sw.
Weuseon.	Fulton.	780	39	50.5	- 0.5	80	6	24	28	38	5.10	+ 2.67	1.21	0	10	13	8	15	w.
Willoughby.	Lake.	649	17	—	—	—	—	—	—	5.34	+ 2.42	1.42	0	11	12	4	15	sw.	
Pennsylvania.																			
Erie.	Erie.	658	38	51.5	- 1.6	73	4	33	28	24	3.47	- 0.33	1.20	0	13	5	10	16	s.
New York.																			
Adams Center.	Jefferson.	540	20	50.4	+ 2.9	72	4	28	28	29	1.43	- 3.00	0.41	1.0	9	8	16	7	s.
Angelica.	Allegany.	1,340	28	46.6	- 0.2	73	4	19	29	37	2.95	- 0.06	0.75	T.	13	4	12	15	w.
Appleton.	Niagara.	270	20	48.8	- 0.2	77	4†	27	28	34	2.71	- 0.19	0.75	0	10	8	13	10	sw.
Auburn.	Cayuga.	715	42	50.2	+ 0.5	79	4	25	28	30	2.12	- 1.33	0.60	0	7	10	15	6	s.
Avon.	Livingston.	585	16	49.1	- 0.8	73	4	24	28	35	1.78	- 0.77	0.60	0	6	7	15	9	—
Blue Mountain Lake.	Hamilton.	1,750	11	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Brockport.	Monroe.	537	15	49.7	- 1.2	72	4	25	28	29	3.23	+ 0.21	0.73	0	12	7	14	10	sw.
Buffalo.	Erie.	767	60	51.2	- 0.3	71	10	33	28	35	3.08	+ 0.15	1.62	T.	11	9	12	10	sw.
Canton.	St. Lawrence.	448	17	47.5	+ 0.3	73	4	24	28	32	5.32	+ 0.18	1.13	2.2	11	4	12	15	sw.
Cape Vincent.	Jefferson.	246	6	50.2 ^d	—	—	—	28	28	37	3.24	+ 0.26	1.80	0	6	20	3	8	n.
Carvers Falls.	Washington.	243	13	47.3	- 1.2	70	2	22	28	37	3.24	+ 0.26	1.80	0	6	7	12	12	s.
Chazy.	Clinton.	151	11	48.6	+ 0.4	72	4	22	28	34	2.40	- 0.32	1.00	1.0	6	7	12	11	sw.
Dannemora.	do.	1,490	6	46.8	- 2.6	71	4	19	28	31	2.67	- 0.54	1.00	2.5	9	12	9	11	sw.
Elba.	Genesee.	500	12	47.2	—	—	—	23	28	32	2.23	- 0.54	0.42	0	10	17	5	9	sw.
Faust.	Franklin.	1,550	9	—	—	—	—	—	—	—	2.55	- 0.83	0.54	0	8	11	8	12	sw.
Fayetteville.	Onondaga.	530	10	51.6	+ 0.9	81	4	26	27	38	2.12	- 1.28	0.48	T.	11	10	8	13	nw.
Gabriels.	Franklin.	1,729	9	44.6	—	71	4	15	28	41	2.79	—	0.81	3.0	12	6	14	11	w.
Harkness.	Clinton.	622	9	47.2	± 0	70	4†	20	28	35	2.38	- 0.11	0.77	3.5	11	22	6	3	w.
Hemlock Lake.	Livingston.	900	13	49.8	- 1.2	73	4	27	28	34	2.01	- 0.50	0.79	T.	3	13	10	8	s.
Hunt.	do.	1,321	12	50.5	- 0.3	76	4	21	28	35	3.34	+ 0.41	0.95	0	7	8	16	7	sw.
Ithaca.	Tompkins.	928	33	49.4	- 0.1	81	4	27	28	34	3.30	+ 0.13	0.56	T.	16	13	4	14	se.
Keene Valley.	Essex.	1,000	13	46.9 ^d	- 0.2	80	4	21	28	47d	3.63	+ 0.16	1.40	1.5	9	12	9	10	nw.
King Ferry.	Cayuga.	11	—	—	—	—	—	—	—	—	2.55	- 0.83	0.54	0	8	11	8	12	se.
Lake George.	Warren.	350	14	48.0	- 1.6	72	12	27	27	33	6.23	+ 2.74	2.31	0	12	10	9	12	sw.
Lake Placid Club.	Essex.	1,864	31	41.8	—	64	10	15	26	32	3.44	—	0.81	11.8	10	14	7	7	nw.
Le Roy.	Genesee.	920	21	49.9	+ 1.6	73	4	25	28	30	2.91	+ 0.31	0.76	T.	12	8	11	12	w.
Lockport.	Niagara.	650	24	49.4	- 1.5	72	4	27	28	32	2.79	+ 0.29	0.60	0	11	13	7	11	sw.
Lowville.	Lewis.	900	44	45.5	- 0.7	71	10	21	28	38†	4.31	- 0.08	0.67	2.0	9	14	10	7	s.
Moira.	Franklin.	200	11	47.6	- 0.5	73	4	24	28	31	2.33	- 0.42	0.70	0.70	8	11	13	7	w.
Nehasane.	Hamilton.	1,750	3	43.6	—	70	4	17	28	36	2.49	—	1.41	9.4	10	10	11	11	w.
North Lake.	Herkimer.	1,822	10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ogdensburg.	St. Lawrence.	175	27	48.9	- 1.2	70	4†	20	30	34	1.98	- 0.36	0.80	T.	9	13	13	5	se.
Old Forge.	Herkimer.	1,733	3	44.7	—	70	4	17	28	35	3.63	—	0.81	1.3	15	7	7	17	w.
Oswego.	Oswego.	335	41	50.0	- 1.2	74	4	30	28	36	3.03	- 0.31	0.93	T.	11	9	7	15	se.
Otto.	Cattaraugus.	1,410	7	50.9	—	72	1†	25	30	34	5.03	—	1.00	0	13	14	10	7	sw.
Palermo.	Oswego.	460	52	—	—	—	—	—	—	—	2.41	- 1.14	0.90	0	8	20	5	6	se.
Perry City.	Schuyler.	1,038	31	46.2	- 1.6	75	4	19	29	38	3.20	- 0.69	0.64	0	11	9	7	15	sw.
Philadelphia.	Jefferson.	485	45	49.6	—	77	22	24	28	32	3.77	—	1.01	T.	15	6	15	10	w.
Potsdam.	St. Lawrence.	300	35	47.8	+ 2.7	75	5	25	27	36	2.86	+ 0.52	1.05	0.5	10	17	7	17	sw.
Raquette Lake.	Hamilton.	3	45.1	—	66	4†	19	27	33	3.84	—	1.16	2.0	10	8	6	17	w.	
Rochester.	Monroe.	523	89	50.4	- 0.4	75	4	28	28	38	2.41	- 0.45	0.64	0	13	16	14	11	sw.
Romulus.	Seneca.	719	19	50.4	- 0.7	78	4	25	28	30	2.60	- 1.22	0.68	0	10	8	8	15	s.
Shortsville.	Ontario.	740	12	50.0	- 1.5	76	4	27	28	32	2.46	- 0.38	0.54	0	11	10	13	8	se.
Skaneateles.	Onondaga																		

TABLE 2.—*Daily precipitation for October, 1911. District No. 4, Lake Region.*

Stations.	Watershed.	Day of month.																																		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total			
<i>Minnesota.</i>																																				
Cloquet.....	L. Superior.....			.34	.01	.50																												1.54		
Duluth.....	do.....			.38	.01	.14	.26																										1.37			
Floodwood.....	do.....																																	1.12		
Stephens Mine.....	do.....																																	0.80		
Two Harbors.....	do.....																																	1.00		
Virginia.....	do.....																																	0.74		
<i>Wisconsin.</i>																																				
Appleton.....	Fox.....	1.43	.06	1.55		.01	1.99	.03																									6.34			
Ashland.....	L. Superior.....			.16		.72																												2.34		
Bayfield.....	do.....			.15		.39																											1.79			
Cecil.....	Fox.....	.49	T.	1.21	T.	.07	2.31																										5.87			
Crandon.....	Forest.....																																			
Florence.....	Menominee.....	.13		.76		2.31																												4.68		
Fond du Lac.....	Fox.....	.89		1.70		T.	1.16																										4.17			
Grand River Locks.....	do.....	1.30	T.	10	1.46		T.	.84	.05																								5.63			
Green Bay.....	L. Michigan.....	.30		1.47	T.	.44	1.64																										4.68			
High Falls.....	do.....			1.24	.03		2.51																										5.94			
Iron River.....	do.....			.20		.05	.65																										2.30			
Kewaunee.....	do.....			.35		1.35																												4.80		
Manitowoc.....	do.....	1.27		2.05			1.75																										6.00			
Menasha.....	Fox.....	.06		1.29		T.	2.12																										T.			
Menomonee Falls.....	L. Michigan.....	1.36	T.	1.41			.30																											3.55		
Milwaukee.....	do.....	.92		2.27		.01	.20																										0.01			
New London.....	Fox.....	.85	T.	05	1.83		T.	2.50																									6.22			
Oconto.....	L. Michigan.....			1.30		.17	4.55																										4.55			
Oshkosh.....	Fox.....	1.37	T.	03	1.13	T.	1.64																										4.91			
Pine River.....	do.....	L. (35	T.	01	1.34		T.	1.89	.07																								7.11			
Plum Island.....	L. Michigan.....	.40		.77	.03		1.90																										4.66			
Plymouth.....	do.....	1.28	T.	.02	.97		T.	1.75																									4.72			
Port Washington.....	do.....			.96	.06		.58																											2.63		
Racine.....	Fox.....	2.20		.56	.44	T.	.11																											4.11		
Ripon.....	Fox.....	1.35	T.	11	1.44		1.43	.06																									5.49			
Sheboygan.....	L. Michigan.....	1.49	T.	1.09	.11		1.82																											5.12		
Superior ||.....	L. Superior.....	.67		1.10		T.	2.17																										T.	6.09		
Waupaca.....	Fox.....	.08		1.94			2.39	.04																										7.42		
<i>Illinois.</i>																																				
Chicago.....	L. Michigan.....	1.22		.39		.01	.25	T.																										3.79		
<i>Indiana.</i>																																				
Auburn ||.....	Maumee.....	.61	.50		.22	T.	.03	.07																										2.92		
Berne.....	do.....	.90	.51		.11	T.	.03	.48																										23		
Elkhart.....	St. Joseph.....	.33	.28	.32	.14		.14	T.																									31			
Fort Wayne.....	Maumee.....	1.26	T.	.27	.02	.02	T.	.36	.03																								3.51			
Hammond.....	L. Michigan.....			1.20	T.		.10	T.																									4.44			
Howe ||.....	St. Joseph.....	.45		.75			.60																										3.72			
South Bend ||.....	do.....	.21	.55		.19		.02	.12	.01																								3.72			
Whiting.....	L. Michigan.....	.51	.29	.11	1.05	.01	.24																										3.36			
<i>Michigan—Upper Peninsula.</i>																																				
Baraga.....	L. Superior.....																																			2.40
Borgland.....	Ontonagon.....																																			2.17
Blaney.....	Manistique.....																																			2.17
Calumet.....	L. Superior.....																																			2.17
Chatham.....	do.....	.02		.17	.05		1.22																											2.17		
Deer Park.....	do.....			.30	T.		.40																											1.73		
Detour.....	St. Marys.....	.40																																		1.73
Eagle Harbor.....	L. Superior.....			.15																															1.66	
Escanaba.....	L. Michigan.....	.20		.87	T.	.17	1.81																											1.66		
Ewen.....	Ontonagon.....	.20		.10		.85																												1.88		
Grand Marais.....	L. Superior.....																																			
Green.....	do.....																																			1.42
Houghton.....	do.....																																			1.99
Humboldt.....	Escanaba.....																																			1.35
Iron Mountain.....	Monominee.....	.08		.71	.09		1.98																											4.01		
Iron River.....	do.....			.50	.45		2.25																											4.90		
Ironwood.....	L. Superior.....			.25			1.10																												2.31	
Ishpeming.....	Escanaba.....	T.		.40	.30		.30																											2.58		
Isle Royale.....	L. Superior.....																																			
Mackinac Island.....	Lake Huron.....	.43	T.	.97	T.	.37	.62																											6.03		
Maple Ridge.....	L. Michigan.....	.13		.49	.17	T.	.90		</																											

TABLE 2.—*Daily precipitation for October, 1911. District No. 4—Continued.*

Stations.	Watershed.	Day of month.																													Total.				
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31			
<i>Michigan—Lower Peninsular—Con.</i>																																			
Berlin.....	Clinton.....	1.21	.24	.30	..	1.13	.0112	.0171	..	T.	.07	.01	T.	.27	4.80	
Big Rapids.....	Muskegon.....	1.55	.03	.45	.61	..	1.73	..	..	.03	..	..	..	..	..	..	1.25	.03	T.	.02	.64	.40	.03	.01	.02	T.	..	.03	.12	6.95			
Bloomingdale.....	L. Michigan.....	1.14	T.	.09	.15	..	.55	..	..	..	..	T.	..	T.	..	..	1.22	..	T.	.64	.13	.25	T.	..	..	..	..	..	..	..	..	.21	4.98
Cadillac.....	Manistee.....	..	.54	.40	1.80	..	..	..	..	..	..	..	..	..	..	..	.80	.03	..	..	.06	.03	..	..	..	..	..	..	..	..	..	.03	3.74
Cassopolis.....	St. Joseph.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Charlevoix.....	L. Michigan.....	..	..	.20	.32	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Charlotte.....	Kalamazoo.....	1.40	.47	T.	..	.8205	.52	..	T.	.37	T.	30	4.31	
Cheboygan.....	Cheboygan.....	.30	1.00	.48	1.20	..	.65	.17	..	..	..	..	..	..	..	..	.10	T.	..	..	.60	.55	.40	..	..	..	..	..	..	..	..	..	4.68
Clinton.....	Raisin.....	.95	.54	.38	..	.65	.1708	T.58	.08	.29	T.16	4.50	
Coldwater.....	St. Joseph.....	.47	.05	1.09	.47	..	.60	.2004	T.45	..	.24	T.22	4.33	
Concord.....	Kalamazoo.....	1.10	T.	.70	.17	..	.75	..	..	..	..	..	..	..	..	..	.26	T.	..	..	.02	T.	..	..	..	..	..	..	..	..	..	.25	3.83
Croton.....	Muskegon.....	1.30	..	.30	1.35	..	1.12	..	..	..	..	..	..	..	..	..	.26	T.	..	..	.02	T.	..	..	..	..	..	..	..	..	..	.05	7.33
Detroit.....	Detroit.....	.77	..	.56	.05	..	.80	..	..	..	..	..	..	..	..	..	.25	T.	..	..	.04	T.	..	..	..	..	..	..	..	..	..	.09	4.30
Durand.....	Saginaw.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
East Tawas.....	Lake Huron.....	.50	..	.95	..	1.1005	T.12	.16	.30	.35	.1610	4.33
Eloise.....	Rouge.....	.88	.02	.55	.10	..	.76	.03	..	..	..	..	..	..	..	..	.30	T.	..	..	.13	..	..	..	..	..	..	..	..	..	..	.15	4.24
Flint.....	Saginaw.....	1.55	.06	.15	.20	..	.0112	T.30	3.53	
Frankfort.....	Betsey.....	.40	..	.68	.28	..	1.7010	T.52	2.22	
Ganges.....	L. Michigan.....	1.79	.04	.65	.28	..	.6720	T.50	.88	T.	T.	.55	6.86	
Gaylord.....	Cheboygan.....	T.	..	.40	.60	.05	1.62	T.20	T.	T.	.05	5.05	
Gladwin.....	Saginaw.....	.65	..	.10	.60	..	.24	..	..	..	..	..	..	..	..	..	.01	T.	..	..	.29	T.	..	..	..	..	..	..	..	..	T.	.33	10.6.74
Grand Haven.....	Grand.....	2.16	..	.57	..	.78	..	..	..	..	..	..	..	..	..	..	.06	T.	..	..	.29	T.	..	..	..	..	..	..	..	..	T.	.25	16.6.71
Grand Rapids.....	Grand.....	..	2.10	.01	.42	T.	1.29	..	..	..	..	..	..	..	..	..	.01	T.	..	..	.29	T.	..	..	..	..	..	..	..	T.	.02	40.5.21	
Grape.....	Raisin.....	1.08	.08	.57	.13	..	.44	.05	..	..	..	..	..	..	..	..	.33	16.04	T.	..	..	..	..	..	..	..	..	T.	.45	25.3.25			
Grass Lake.....	Grand.....	T.	..	.60	.45	..	.60	..	..	..	..	..	..	..	..	..	.21	T.	..	..	.90	..	..	..	..	..	..	..	T.	.45	25.5.56		
Grayling.....	Au Sable.....	.59	1.20	.26	..	1.69	..	..	..	..	..	..	..	..	..	..	.21	T.	..	..	.54	..	.79	.28	..	..	..	..	T.	T.	.30	4.73	
Harbor Beach.....	Lake Huron.....	.80	..	.10	..	1.80	..	..	..	..	..	..	..	..	..	..	.98	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Harrison.....	Saginaw.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	.05	T.	..	..	.42	.20	..	..	..	..	..	..	..	..	T.	.15	15.3.61
Hartville.....	Lake Huron.....	.09	.40	.30	.60	..	.66	..	..	..	..	..	..	..	..	..	.05	T.	..	..	.42	.20	..	..	..	..	..	..	..	T.	.51	3.83	
Hart.....	Pentwater.....	..	.68	..	..	..	..	..	..	..	..	..	..	..	..	..	.52	T.	..	..	.32	.20	..	..	..	..	..	..	..	T.	.25	4.18	
Hayes.....	Pigeon.....	.65	..	.20	..	1.50	..	..	..	..	..	..	..	..	..	..	.30	T.	..	..	.18	.90	.10	..	..	..	..	..	..	..	T.	.25	4.18
Highland.....	Huron.....	1.35	.57	.35	.72	..	.72	..	..	..	..	..	..	..	..	..	.20	T.	..	..	.14	..	.61	..	..	..	..	..	..	..	T.	.18	10.05.62
Hillsdale.....	St. Joseph.....	.65	50	.05	.30	20	.61	T.	..	.09	T.03	T.02	..	.40	T.	T.	.33	10.6.74	
Holland.....	L. Michigan.....	1.70	..	.33	.30	..	.6101	T.92	..	.08	T.	T.	.25	16.6.71	
Howell.....	Saginaw.....	1.50	..	.45	.40	..	.80	.1020	T.15	..	.80	T.	T.	.02	40.5.21	
Ivan.....	Manistee.....	.70	..	.69	.43	..	2.0504	T.70	..	.16	T.	T.	.58	5.87	
Jackson.....	Grand.....	.94	.08	.55	.10	..	.60	.0804	T.50	..	.20	T.	T.	.41	4.31	
Jeddo.....	St. Clair.....	1.09	..	.08	.34	..	1.00	.0508	T.49	..	.10	T.	T.	.41	4.31	
Kalamazoo.....	Kalamazoo.....	1.33	.42	.30	..	.7513	T.16	..	.40	T.	T.	.15	14.5.00	
Lansing (Agricultural College).....	do.....	1.83	..	.38	.37	..	.6908	T.01	..	.47	T.	T.	.02	36.4.89	
Lapeer.....	Saginaw.....	1.34	..	.20	.48	1.00	..	..	..	..	..	..	..	..	..	..	.10	T.	..	..	.57	..	.44	..	..	..	..	..	..	..	T.	.40	4.53
Ludington.....	Pere Marquette.....	.74	..	.68	.54	..	.52	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	T.	.07	5.07	
Luther.....	Manistee.....	1.02	.49	.40	1.95	.0207	T.75	..	.18	T.	T.	.10	3.82	
Mackinaw.....	Saginaw.....	.29	..	.52	.15	..	..	..	..	..	..	..	..	..	..	..	.06	T.	..	..	.01	..	.07	T.	..	..	..	..	..	..	..	T.	.02

TABLE 2.—Daily precipitation for October, 1911. District No. 4—Continued.

Stations.	Watershed.	Day of month.																														Total.			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31			
Ohio—Continued.																																			
Medina.....	Lake Erie.....	2.23	.63	.04	T.	.78					.38	.11																					T.	.68	6.20
Montpelier.....	Maumee.....	.77	.38	.27	.12	.33	T.				T.																						T.	.06	3.46
Napoleon.....	do.....	1.53	.42	.38	.12	.02	.86																										T.	.21	5.01
New Bremen.....	do.....	.51		.02		.62					.15																						T.	.30	3.07
North Royalton.....	Lake Erie.....	1.93	.40	.16	.16	.92					.43		.20																				T.	.63	6.24
Norwalk.....	do.....	1.60	.14	.75		.75					.40	.04																					T.	.05	3.31
Oberlin.....	do.....	1.30	.12	.70	.12	.18	.93				.10	.24	.14																		T.	.54	5.66		
Ottawa.....	Maumee.....	1.10	.39	.04	.11	.75	.05				.32																					T.	.12	4.35	
Sandusky.....	Lake Erie.....	1.33	.08	.57	.20	1.06	.01	T.	.35	.36		.65	.04	T.	.15															T.	.07	5.06			
Tiffin.....	Sandusky.....	2.10	.32	.25	.12	T.	.10	.31			.43	.05			.11	.03	.15	.55	T.										T.	.13	2.15				
Toledo.....	Maumee.....	.97	.19	.79	.18	.52	.01	T.	.45	.17		.09	.03	.01	.51														T.	.13	4.46				
Upper Sandusky.....	Sandusky.....	.82	.45	.05		.22	.30			.60																				T.	.50	4.43			
Vickery.....	Lake Erie.....	1.35	.17	.77	.28	.30	1.08				.38																			T.	.03	5.58			
Waauseon.....	Maumee.....	1.21	.20	.42	.16	.53	.02	T.	.11			.03	.14	.56	.43														T.	.19	5.10				
Willoughby ||.....	Lake Erie.....	1.42	.34	.13	1.01	.16					.29	.17																		T.	.50	5.34			
Pennsylvania.																																			
Erie.....	Lake Erie.....	.54	.03	.08	.30	.47					.13																					T.	.04	3.47	
New York.																																			
Adams Center.....	L. Ontario.....	.13	.07	.41	.05	.23					.07																					T.		1.43	
Altmar.....	do.....	.41		.86	.02	.60					.05																					T.	.65	3.97	
Angelica.....	Genesee.....	.60	.02	.28	.04	.22	.53				.29																				T.	.44	2.95		
Appleton.....	L. Ontario.....	.36	T.	.13		.75	T.				.25																				T.	.29	2.71		
Auburn.....	Oswego.....	.60	T.	.22		.52					.26																				T.	.06	2.12		
Avon.....	Genesee.....	.60	T.	.20		.32	.08																								T.	.46	1.78		
Blue Mountain Lake.....	Raquette.....																																		
Boonville.....	Black.....	.55		.93	.10		.75				.25																						T.	.55	4.60
Brockport.....	L. Ontario.....	.40	.01	.14	.53	.36					.05																				T.	.30	3.23		
Buffalo.....	Lake Erie.....	.57	T.	.22		.48					.05		T.																		T.	.41	3.68		
Canton.....	Grass.....	.28	T.	.12	.01	.31							T.																		T.	.45	3.52		
Carvers Falls.....	L. Champl'n.....	.38		.03	.100	T.																									T.	.22	3.24		
Chazy.....	do.....	.03																													T.	.35	2.40		
Dannemora.....	do.....	.65		1.00	.13	.16																									T.	.22	2.67		
Elba.....	L. Ontario.....	.31		.05	T.	.25	.10	.42			.15																			T.	.32	2.23			
Faust.....	Raquette.....	.45		.105		.45																									T.	.22	3.10		
Fayetteville.....	Oswego.....	.48	.02	.06		.08	.22	T.			.18																			T.	.28	2.12			
Gabriels.....	St. Regis.....	.30		.81	.17	T.	.30																							T.	.35	2.34			
Harkness.....	L. Champl'n.....	.21	.01	.68	.04	.03	.23																							T.	.13	2.38			
Hemlock Lake.....	Genesee.....	.62																													T.	.20	2.01		
Hooker.....	L. Ontario.....	.13		.140		.90																								T.	.77	6.03			
Horse Shoe.....	St. Lawrence.....	.25																													T.	.46	3.34		
Hunt.....	Genesee.....	.73		.41	.95	.35					.33																			T.	.29	3.30			
Ithaca.....	Oswego.....	.55	.01	.03	.43	T.	.50	.03			.37	.02																	T.	.20	3.63				
Keene Valley.....	Ausable.....	.23	.12	.54	.18	.12	.20				.30		T.																T.	.20	3.63				
King Ferry.....	Oswego.....	.54		.15		.54					.30		T.																T.	.08	.33				
Lake George.....	L. Champl'n.....	.51	.03	.67		.14	.51	.23			.30		T.															T.	.06	.36					
Lake Placid Club.....	Ausable W. Branch.....	.46		.81	.09	.35	.23				.24		T.															T.	.35	3.44					
Leisers Mill.....	Black.....	.42			.103	.46	.45	.33			.03																	T.	.46	6.21					
Le Roy.....	Genesee.....	.73		.25	.02	.76	.05				.37																	T.	.27	2.91					
Lockport.....	L. Ontario.....	.49				.07	.48	.23			.21																	T.	.40	2.94					
Lowville.....	Black.....	.50				.60	.10	.44			T.																	T.	.30	3.31					
Moira.....	St. Lawrence.....	.12				.70		.35																				T.	.37	2.33					
Nehasane.....	Black.....	.29	.02	.141	.25	.40	.24				T.																T.	.52	4.29						
North Osceola.....	L. Ontario.....	.40		.60	.74	.70					.08																	T.	.30	5.63					
Ogdensburg.....	St. Lawrence.....	.20			.10	T.	.02	.30			.01		T.														T.	.35	1.98						
Old Forge.....	Black.....	.38	.06			.28	.30	.36																				T.	.38	3.63					
Oswego.....	L. Ontario.....	.39				.66	T.	.48</																											

TABLE 3.—Maximum and minimum temperatures at selected stations for October, 1911. District No. 4, Lake Region.

Date.	Duluth, Minn.	Wisconsin.								Chicago, Ill.	Fort Wayne, Ind.	Upper Michigan.								Lower Michigan.								
		Florence.		Green Bay.		Milwaukee.			Escanaba.			Ewen.		Houghton.		Marquette.		Sault Ste. Marie.		Alpena.		Battle Creek.		Cadillac.				
		Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.			Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	
1....	54	46	58	44	59	49	57	54	64	54	70	51	54	48	60	40	58	42	54	46	55	43	54	50	56	51	52	45
2....	53	46	58	45	60	50	57	54	59	54	55	49	56	49	59	36	52	47	54	45	56	40	55	48	61	48	54	46
3....	56	45	52	40	63	50	70	53	79	54	76	46	57	50	58	39	60	46	56	44	53	39	60	50	58	48	53	40
4....	53	37	54	41	60	41	63	49	71	52	71	50	58	40	50	40	60	39	57	40	56	39	60	44	69	54	65	39
5....	48	37	47	29	50	36	54	43	56	51	56	43	48	37	48	25	50	34	49	40	48	36	49	40	54	37	51	38
6....	47	39	45	38	49	45	64	49	77	52	80	48	46	42	48	35	46	41	45	39	44	38	46	43	66	48	48	41
7....	58	34	54	40	55	43	55	46	54	50	54	41	57	40	55	38	53	42	52	40	54	34	52	35	54	43	53	36
8....	66	40	63	33	63	41	59	44	54	50	60	39	62	38	64	34	62	44	70	44	60	34	64	33	61	33	59	37
9....	63	42	66	37	62	43	60	48	60	54	62	44	60	42	71	34	62	46	63	48	70	37	64	41	61	37	63	40
10....	56	39	60	39	58	49	61	54	65	57	63	52	59	45	65	32	61	39	59	47	58	41	55	41	60	51	58	45
11....	64	44	65	45	64	49	62	52	63	53	65	50	60	48	65	34	60	50	60	48	54	47	59	42	63	50	60	45
12....	62	45	65	37	63	44	66	52	64	54	66	44	60	42	63	30	55	40	54	44	64	42	60	42	66	48	64	40
13....	48	45	58	29	58	42	60	52	63	56	61	46	55	44	60	29	57	39	55	38	55	34	54	39	61	43	61	37
14....	49	46	55	44	56	41	58	55	62	54	63	45	55	52	55	36	53	46	53	45	57	38	55	37	67	46	58	42
15....	52	46	59	46	60	51	61	52	60	57	62	42	59	45	56	36	61	47	57	47	59	39	59	36	65	50	66	42
16....	49	45	57	46	67	52	66	57	74	59	77	52	61	50	60	38	56	47	60	48	58	40	58	41	73	49	66	45
17....	57	43	58	49	62	47	62	52	64	54	65	47	60	47	58	36	56	48	60	46	58	41	62	43	66	54	63	50
18....	52	40	57	37	65	45	67	49	67	51	65	42	60	41	54	33	58	38	44	37	57	34	76	42	65	41	64	41
19....	49	35	58	37	56	42	57	48	56	51	69	45	58	42	54	33	52	44	58	42	58	41	55	48	65	55	69	47
20....	44	37	55	29	54	38	57	45	56	49	59	48	56	35	50	34	50	40	49	39	56	40	59	45	54	46	57	40
Mns..	48.8	35.0	51.7	34.7	53.7	40.7	55.8	44.8	58.6	47.9	59.8	42.6	52.1	39.1	51.8	30.6	50.5	38.9	51.1	39.1	51.5	36.0	53.8	39.2	57.3	42.5	53.7	39.0

Date.	Lower Michigan.								Ohio.								Erie, Pa.	New York.								Vermont.			
	Detroit.		Muskegon.		Saginaw, West Side.		Cleveland.		Lima.		Sandusky.		Toledo.		Buffalo.		Canton.		Rochester.		Syracuse.		Burling- ton.		North- field.				
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.			
1....	54	51	55	50	52	49	59	52	67	53	61	52	59	52	57	49	50	46	50	41	50	47	50	44	48	34	49	29	
2....	58	48	58	50	58	49	57	50	68	45	58	54	56	49	57	47	56	44	54	36	55	49	58	44	54	40	55	31	
3....	65	49	55	42	55	40	68	47	68	58	70	46	71	48	65	43	61	38	55	27	59	40	60	37	54	28	65	36	
4....	69	48	66	52	69	51	72	52	60	40	73	54	72	51	73	52	67	50	73	49	75	48	78	46	64	46	65	36	
5....	53	43	60	48	52	35	52	48	60	43	54	47	54	43	52	47	52	44	54	39	52	44	56	40	56	38	56	38	
6....	60	45	50	42	49	45	75	48	80	48	79	49	78	47	61	47	50	39	45	31	50	40	48	36	45	32	45	30	
7....	51	41	56	34	52	42	52	44	72	40	55	45	51	42	49	41	49	39	50	34	48	38	52	36	40	30	48	27	
8....	58	39	60	36	62	32	55	38	57	38	58	42	57	41	54	39	57	41	52	39	54	36	57	34	54	29	62	22	
9....	60	48	65	44	64	35	62	44	63	54	69	46	59	45	60	41	61	49	63	45	65	40	63	46	62	42	61	34	
10....	58	51	60	50	57	44	56	51	67	47	58	52	59	51	68	50	71	46	67	39	72	44	70	43	67	37	68	29	
11....	62	52	60	48	63	45	60	49	62	41	62	50	64	49	59	54	58	52	58	43	56	53	59	57	42	60	33	53	
12....	65	46	62	45	69	42	57	54	60	45	59	47	65	47	59	50	63	51	63	48	61	45	66	43	65	41	64	33	
13....	59	45	64	43	60	37	55	46	58	41	58	47	58	43	55	42	55	44	52	34	52	40	49	38	52	39	61	29	
14....	60	47	60	48	58	41	63	45	59	42	63	43	58	46	61	40	65	41	60	32	63	37	64	39	58	31	60	27	
15....	67	51	68	54	70	47	61	52	67	54	64	49	69	50	65	53	64	54	65	39	67	52	61	51	63	43	64	31	
16....	70	52	75	53	71	47	72	49	74	51	74	52	74	51	64	47	68	52	63	44	60	45	63	37	65	29	74	34	
17....	63	54	68	54	63	54	64	55	68	55	67	55	65	53	64	54	62	58	62	60	52	65	55	61	44	64	34	69	
18....	62	50	62	40	67	41	57	49	60	46	59	49	64	49	58	47	60	45	62	57	53	60	48	55	52	64	46	66	
19....	67	50	60	50	65	43	62	44	64	40	67	46	68	47	62	43	64	44	61	48	65	41	60	48	55	46	66	36	
20....	60	49																											